## Appendix E: Disinfectants and Properties

All surfaces should be cleaned thoroughly before disinfection. For basic disinfection, a 1:100 dilution of household bleach (i.e., 2.5 tablespoons per gallon) or a 1:1,000 dilution of quaternary ammonium compounds (e.g., Roccal or Zephiran) may be used. For disinfection when a particular organism has been identified, use the table below. All compounds require a contact time of ≥10 minutes. Local or state environmental health officers might have recommendations for appropriate disinfectant selection and precautions for environmental effect. Additional information is available from the Purdue University National Biosecurity Resource Center for Animal Health Emergencies. Available at www.biosecuritycenter.org/dismixchrt.htm.

**Chemical compounds used for disinfection, effectiveness of chemical disinfectants against certain organisms, and selected properties of chemical disinfectants that should be considered when used for cleaning and disinfection**

| Chemical compounds | Chlorine* 0.01–5% | Iodine iodophor 0.5–5% | Chlorhexidine 0.05–0.5% | Alcohol† 70% | Oxidizing agents 0.2–3% | Phenol 0.2–3% | Quaternary ammonium 0.1–2% |
|---|---|---|---|---|---|---|---|
| **Selected products** | Clorox® | Tincture/ Provodine | Nolvasan® | Rubbing alcohol | Virkon-S® | pHisoHex® | Roccal-D® |
| **Effectiveness of chemical disinfectants against certain organisms§** | | | | | | | |
| **Bactericidal** | Good | Good | Good | Good | Good | Good | Good |
| **Bacterial spores** | Good¶ | Poor | Poor | Poor¶ | Fair to good | Poor | Poor |
| **Virucidal** | Good | Good | Poor | Fair | Good | Poor** | Poor |
| **Envelope viruses** | Yes | Yes | Limited | Yes | Yes | Limited | Limited |
| **Non-envelope viruses** | Yes | Limited | No | No | Yes | No | No |
| **Fungicidal** | Good | Fair | Fair to good | Good | Fair | Fair | Fair |
| **Protozoal parasites** | Fair (concentrated) | Poor | Poor | Poor | Poor | Poor | Fair (ammonia) |
| **Properties of chemical disinfectants††** | | | | | | | |
| **Effectiveness in organic matter** | Poor | Poor | Fair | Poor | Poor | Good | Poor |
| **Inactivated by soap** | No | Yes | No | No | No | No | Yes |
| **Effective in hard water** | Yes | No | Yes | Yes | Yes | Yes | No |
| **Residual activity** | Poor | Poor | Good | Fair | Poor | Poor | Fair |

**Source:** Adapted from the Nebraska Cooperative Extension and the U.S. Department of Agriculture, 2003.

* Bleach should be diluted to 1:32, mixed fresh daily and replaced whenever contaminated with organic matter (1:32 dilution of 5.75% solution provides > 1500 ppm chlorine).

† Rubbing alcohol is flammable.

§ Effectiveness as a bactericidal, virucidal, or fungicidal agent and effectiveness in eliminating bacterial spores and protozoal parasites: Good indicates effective, Fair indicates some effect, Poor indicates inferior effect; Effectiveness in eliminating envelope and non-envelope viruses: Yes indicates effective, limited indicates moderate effect, no indicates not effective

¶ Alcohol synergistically potentiates the sporicidal effect of hypochlorites (chlorine). Mix 5.75% solution of hypochlorite 1:1 with 50% ethyl alcohol/water. Mix fresh at the time of use and provide contact time of at least 30 minutes.

** 2-phenylphenol (ortho-phenylphenol) is fair.

†† Effectiveness in organic matter: Good indicates effective, fair indicates some effect, poor indicates inferior effect; Inactivated by soap and Effective in hard water: Yes indicates chemical compound has this property, No indicates chemical compound does not have this property; Residual activity: Good indicates chemical compound has residual activity, fair indicates some residual activity, poor indicates inferior residual activity